

***Operations and Maintenance  
Plan for the Pad A Limited  
Action Operable Unit 7-12 at  
the Radioactive Waste  
Complex***

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May 2005

**Idaho  
Cleanup  
Project**

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# **Operations and Maintenance Plan for the Pad A Limited Action Operable Unit 7-12 at the Radioactive Waste Management Complex**

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**May 2005**

**Idaho Cleanup Project**

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## **ABSTRACT**

This site-specific operations and maintenance plan describes the activities and procedures required to maintain the Waste Area Group 7 Operable Unit 7-12 Pad A site, located inside the Subsurface Disposal Area at the Radioactive Waste Management Complex at the Idaho National Laboratory.



## CONTENTS

|  |     |
|--|-----|
| ABSTRACT.....  | iii |
| ACRONYMS.....  | vii |
| 1. GENERAL .....   | 1   |
| 1.1 Vegetative Cover .....   | 1   |
| 1.2 Soil Cover.....  | 2   |
| 1.3 Rock Armor .....   | 3   |
| 1.4 Monitoring Plan.....   | 3   |
| 1.5 Pad A Lysimeter Well Sampling .....  | 3   |
| 2. VEGETATIVE COVER .....  | 4   |
| 3. SOIL COVER.....   | 5   |
| 4. ROCK ARMOR .....  | 5   |
| 5. PAD A LYSIMETER SAMPLING .....  | 5   |
| 6. OPERABLE UNIT 7-12 PAD A MAINTENANCE AND MONITORING<br>REQUIREMENTS (BASED ON THE FIVE-YEAR REVIEW COMPLETED IN 2003) ..... | 6   |
| 7. REPORTING REQUIREMENTS .....  | 7   |
| 7.1 Inspection .....   | 7   |
| 7.2 Maintenance .....  | 7   |
| 7.3 Reporting.....   | 7   |
| 8. REFERENCES .....  | 7   |
| Appendix A—Operable Unit 7-12 Pad A Inspection of Vegetative Cover, Soil Cover, and Rock Armor<br>Report Form.....             | 9   |

## FIGURES

|                                 |   |
|---------------------------------|---|
| 1. Pad A lysimeters wells ..... | 2 |
|---------------------------------|---|

## TABLES

|  |   |
|--|---|
| 1. Pad A operations and maintenance plan summary .....                   | 4 |
| 2. Operable Unit 7-12 Pad A maintenance and monitoring requirements..... | 6 |



## ACRONYMS

|      |   |
|------|---|
| ARDC | Administrative Record and Document Control  |
| BCP  | baseline change proposal                    |
| DEQ  | (Idaho) Department of Environmental Quality |
| DOE  | U.S. Department of Energy                   |
| EDMS | Electronic Document Management System       |
| EPA  | U.S. Environmental Protection Agency        |
| INL  | Idaho National Laboratory                   |
| LTS  | long-term stewardship                       |
| OU   | operable unit                               |
| SDA  | Subsurface Disposal Area                    |
| USGS | United States Geological Survey             |
| WAG  | waste area group                            |





# Operations and Maintenance Plan for the Pad A Limited Action Operable Unit 7-12 at the Radioactive Waste Management Complex

## 1. GENERAL

This site-specific operations and maintenance plan describes the activities and procedures required to maintain the Waste Area Group (WAG) 7 Operable Unit (OU) 7-12 Pad A site, located inside the Subsurface Disposal Area (SDA) at the Radioactive Waste Management Complex at the Idaho National Laboratory (INL). Figure 1 shows the SDA, including the Pad A lysimeter wells. Basic elements of this operations and maintenance plan include a description of inspections, maintenance, monitoring, and lysimeter well sampling for Pad A.

This operations and maintenance plan will supersede Appendix N of the *Remedial Design/Remedial Action (RD/RA) Work Plan, Pad A Limited Action Radioactive Waste Management Complex, Operable Unit (OU) 7-12* (INEL 1994). The *Two-Year Review Idaho National Engineering Laboratory Subsurface Disposal Area Pad A Operable Unit 7-12* (Wilkening 1997) was completed by the U.S. Environmental Protection Agency (EPA) and reviewed by the Idaho Department of Health and Welfare, Division of Environmental Quality—now called the Idaho Department of Environmental Quality (DEQ)—in December 1997. The *Five-Year Review Report for OU 7-12 (Pad A)* (Poeton 2003) was completed by the EPA and reviewed by the DEQ in 2003.

The SDA, including Pad A, is being evaluated in the WAG 7 comprehensive remedial investigation/feasibility study. The operations and maintenance, monitoring, and other elements of Pad A long-term stewardship (LTS) could be affected by future decisions for OU 7-13/14 (Holdren and Broomfield 2004). Items regarding institutional controls that are not addressed in the following subsections are detailed in the *INEEL Sitewide Institutional Controls Plan* (DOE-ID 2004).

In accordance with the *Record of Decision: Declaration for Pad A at the Radioactive Waste Management Complex Subsurface Disposal Area* (DOE-ID 1994), the post-Record of Decision monitoring program for OU 7-12 included measuring soil moisture content with neutron access tubes (NATS). Monitoring equipment installed during the Pad A limited action included one horizontal and several vertical NATS (INEL 1995). However, the horizontal NAT did not provide useful data and the vertical NATS were monitored until 1996 when this program requirement was eliminated (Holdren et al. 2002). Therefore, NATS monitoring is not addressed in this operations and maintenance plan.

Items that are addressed in this operations and maintenance plan include quarterly inspection and maintenance of the vegetative cover, soil cover, and rock armor; quarterly monitoring of the Pad A area; and annual sampling of the Pad A lysimeter wells. These activities are detailed in the following subsections.

### 1.1 Vegetative Cover

Quarterly inspection and corrective maintenance of the vegetative cover will include the following:

- Inspection of non-growth areas
- Inspection and maintenance of sparse growth areas or areas that have degraded
- Maintenance of weeds and shrub encroachment.

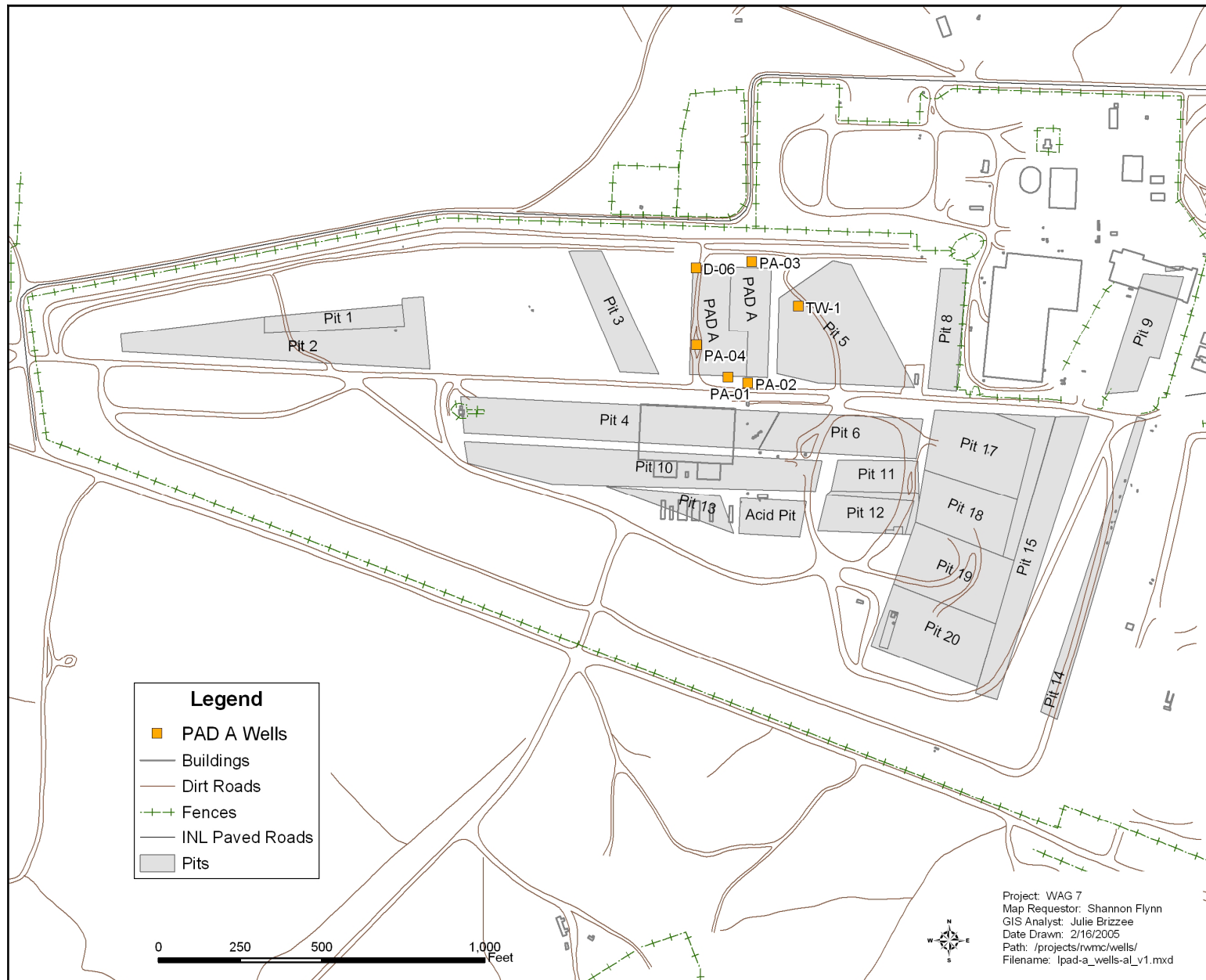


Figure 1. Pad A lysimeters wells.

## **1.2 Soil Cover**

Quarterly inspection and corrective maintenance of the soil cover will include the following:

- Inspection for signs of erosion and/or subsidence areas
- Inspection for signs of animal intrusion into the soil cover
- Surveying to determine slope movement
- Inspection for signs of ponding or localized subsidence
- Maintenance to repair areas of animal intrusion
- Maintenance to repair areas of erosion, subsidence, and/or ponding.

## **1.3 Rock Armor**

Quarterly inspection and corrective maintenance of the rock armoring will include the following:

- Inspection of rock-armored slopes
- Inspection for weed encroachment
- Inspection for possible signs of subsidence and/or erosion
- Maintenance to repair any problem areas.

## **1.4 Monitoring Plan**

Annual monitoring of the Pad A area will include the following:

- Monitoring of the lysimeter and monitoring wells
- Monitoring of the vegetative cover, soil cover, and rock armor
- Reporting inspection results and sampling results.

## **1.5 Pad A Lysimeter Well Sampling**

Annual sampling of the Pad A lysimeter wells will be discontinued under OU 7-12 and incorporated into overall WAG 7 monitoring under OU 7-13/14. Monitoring and reporting by OU 7-13/14 will involve the following:

- Collecting and analyzing lysimeter well samples based on priorities established by OU 7-13/14
- Sending the sampling results to the U.S. Department of Energy Idaho Operations Office (DOE Idaho), DEQ, and EPA by way of the WAG 7 annual monitoring report prepared by OU 7-13/14.

The monitoring frequencies outlined in this plan are summarized in Table 1. In addition, Figure 1 shows the Pad A lysimeter wells.

Table 1. Pad A operations and maintenance plan summary.

| Item(s)                                      | Frequency  |
|--|--|
| Vegetative cover, soil cover, and rock armor | <p>The vegetative cover, soil cover, and rock armor will be inspected quarterly by LTS personnel or the LTS designee in accordance with this operations and maintenance plan. Results will be retained in the LTS Program's Pad A files, and copies will be sent to the Administrative Record and Document Control (ARDC) and to the DOE Idaho for their files.</p> <p>In addition, results from the quarterly inspections of the vegetative cover, soil cover, and rock armor will be compiled annually and distributed to the DEQ and EPA.</p> |
| Pad A lysimeter well sampling                | <p>Annual sampling of the Pad A lysimeter wells will be discontinued under OU 7-12 and incorporated into overall WAG 7 monitoring under OU 7-13/14. The lysimeter sampling results will be retained in the OU 7-13/14 project files, and copies will be sent by WAG 7 personnel to the ARDC and DOE Idaho for their files, with additional distribution to the DEQ and EPA.</p>  |

## 2. VEGETATIVE COVER

Vegetation on Pad A will be monitored quarterly in early spring (usually in April or after the snow has melted), mid-summer (usually in July), late summer to early fall (usually in August or September), and late fall (usually in October or before the first snowfall) to ensure proper vegetative coverage, weed control, and erosion evaluation. Qualitative information will be documented on an annual basis for the vegetative cover and will be incorporated into the LTS Program's Pad A files, Administrative Record and Document Control (ARDC), and a copy will be sent to DOE Idaho for their files.

The quarterly inspections will document areas experiencing failure of the prescribed vegetation (areas larger than 10 × 10 ft). These areas will be documented, as evidenced by lack of perennial grass, invasion by weeds (primarily Russian thistle, cheatgrass, and tumble mustard), or encroachment of shrubs (e.g., sagebrush and rabbitbrush) because of competition with the desired vegetation (i.e., crested wheat grass) as well as the extensive rooting depths of some shrubs. At the time of vegetation monitoring, qualitative information on surface erosion also will be collected. Observations—such as soil movement (as evidenced by the accumulation of soil on the up-slope side of plants, pedestalling of plants or rocks, ponding, or the formation of rills or gullies)—will be recorded on the inspection form, and the extent of erosion will be noted.

Weeds will be removed twice per year: in early summer (usually in June) before the weed seeds are dispersed and in early fall (usually in September). To reduce competition with desired vegetation, weed species will be removed to the extent practicable by LTS personnel or the LTS designee. Removal of weeds will encompass all of Pad A, including the rock armor, to reduce transportation of weed seeds to exposed areas. Hand pulling the weeds or using gas-powered weeder is the recommended method of weed removal, because the use of herbicides is prohibited on this site. All weeds will be bagged and disposed of in a proper manner.

### **3. SOIL COVER**

Either LTS personnel or an LTS designee will inspect the soil cover quarterly—in the late spring (usually in April after the snow has melted), in mid-summer (usually in July), in the late summer or early fall (usually August or September), and in late fall (usually in October or before snow has accumulated). The inspector will pay particular attention to areas where the vegetative cover has degraded. Visual inspection will identify areas on the slopes affected by erosion and/or subsidence. Qualitative information will be documented on a quarterly basis for soil erosion evaluation and incorporated into the LTS Program's Pad A files. Copies will be sent to DOE Idaho and the ARDC.

Erosion and/or subsidence rills will be backfilled when deeper than 3 in. or wider than 6 in. over a distance that exceeds 10 ft. Areas on the top of the cover showing signs of ponding or localized subsidence also will be addressed by backfilling. The backfill will be material suitable for required compaction and will be free of debris, organic materials, frozen matter, and excessive moisture or dryness. All repairs to the cap components must be completed in accordance with original construction specifications and requirements. These repairs will be documented in addition to information such as moisture content and compaction.

During soil cover inspections, all animal intrusions into the soil cover will be documented, and all animal intrusions larger than 2 in. in diameter will be filled with topsoil in accordance with procedures from the *Pad A Limited Action Long-Term Monitoring Plan, Operable Unit 7-12* (INEL 1995).

A digital topographic survey and global positioning system survey of the cover will be conducted during each summer. At the completion of each survey, a report will be generated and compared with past surveys to check for movement of slopes and general cover subsidence. Areas of concern will be documented each summer to determine whether movement or subsidence is continuing.

### **4. ROCK ARMOR**

Either LTS personnel or the LTS designee will inspect the rock armor quarterly—in the late spring (usually in April after snow has melted), in mid-summer (usually in July), in the late summer or early fall (usually in August or September), and in late fall (usually in October or before snow has accumulated). The south face of Pad A is covered with rock armor rather than vegetation, because a very steep slope (2.5:1) is required to maintain Pad A and the road configuration as it now exists. The rock armor provides a stable slope that resists erosion. Qualitative erosion and subsidence information will be documented and incorporated into the LTS Program's Pad A files; copies will be sent to ARDC and DOE Idaho.

If the rock armor subsides and/or erodes (e.g., erosion rills, rock movement, or rock settling more than 12 in. in depth below the design grade), the rock armor will be repaired. The rock will be placed on the slope to design grade in accordance with the required specifications stated in the *Pad A Limited Action Long-Term Monitoring Plan, Operable Unit 7-12* (INEL 1995). The rock armor replacement will consist of durable angular or crushed stone that is free of organic materials and has a minimum diameter of 3 in. and a maximum diameter of 6 in. Material gradation will be verified by visual inspection.

### **5. PAD A LYSIMETER SAMPLING**

The requirement to monitor for nitrates annually from the Pad A lysimeters is eliminated based on cumulative risk assessments for OU 7-13/14. The cumulative nitrate hazard index for the entire SDA using the upper-bound inventory for nitrates is 1.0 (Holdren et al. 2002), and the nitrate hazard index based on best-estimate inventory will be less than 1.0, which is less than the threshold value for remedial

decision-making. Uranium is a much more significant contaminant of concern for OU 7-13/14. Lysimeter sample volumes are often small, and the annual requirement to monitor nitrates typically precludes analysis of other contaminants such as uranium. Pad A contains about 20% of the uranium in the entire SDA (Holdren and Broomfield 2004). Therefore, the requirement to monitor for nitrate is eliminated to facilitate monitoring of uranium and other OU 7-13/14 contaminants of concern. Nitrates will be analyzed in lysimeter samples only when sufficient sample volume is available to analyze anions in accordance with standard OU 7-13/14 analyte priorities (see Holdren and Broomfield 2004). Lysimeter sampling results will be retained in the OU 7-13/14 project files, and copies will be sent by WAG 7 personnel to the ARDC and DOE Idaho for their files with additional distribution to the DEQ and EPA. In accordance with an agreement between DOE Idaho and the regulatory agencies, Well USGS-92 (which is an open borehole, perched-water monitoring well) will be monitored for nitrates under the Pad A agreement from the two-year review conducted in December 1997. The five-year review indicated that USGS-92 continued to exceed background levels for nitrates, but the levels were below the drinking water maximum contaminant level.

## **6. OPERABLE UNIT 7-12 PAD A MAINTENANCE AND MONITORING REQUIREMENTS (BASED ON THE FIVE-YEAR REVIEW COMPLETED IN 2003)**

Table 2 shows the OU 7-12 Pad A maintenance and monitoring requirements.

Table 2. Operable Unit 7-12 Pad A maintenance and monitoring requirements.

| Item | Activity  | Description  | Frequency  |
|------|---|--|--|
| 1    | Inspect vegetative cover, soil cover, and rock armor.                         | Vegetative cover, soil cover, and rock armor will be inspected.<br><br>Inspection results will be retained in the LTS Program's Pad A file, and copies will be sent to ARDC and DOE Idaho.   | Quarterly. Requirement will be reevaluated during the next five-year review. |
| 2    | Evaluate vegetative cover, soil cover, and rock armor monitoring requirement. | Vegetative cover, soil cover, and rock armor will be evaluated. Evaluation results will be sent to the EPA, DEQ, and DOE Idaho.  | Annually. Requirement will be reevaluated during the next five-year review.  |
| 3    | Report inspection results.  | Results of the inspection and maintenance activities will be reported to DOE Idaho.<br><br>At the completion of the late spring inspection (performed after the snow has melted), the results will be sent to DOE Idaho, DEQ, and EPA along with all quarterly inspections completed that fiscal year. | Annually. Requirement will be reevaluated during the next five-year review.  |
| 4    | Sample the USGS-92 perched water monitoring well.                             | The USGS will sample the USGS-92 monitoring well semiannually for nitrates and report the results to WAG 7 personnel. Results will be sent by WAG 7 personnel to the LTS Program's Pad A files, ARDC, DOE Idaho, DEQ, and EPA.   | Ongoing. Requirement will be reevaluated during the next five-year review.   |

## **7. REPORTING REQUIREMENTS**

### **7.1 Inspection**

A representative from the LTS Pad A project team inspect Pad A quarterly, including late fall and late spring, when feasible. All information will be recorded on the attached report form (Appendix A).

Upon each inspection of Pad A, the inspection form will be completed, signed, dated, and incorporated into the LTS Program's Pad A project files. Copies will be sent to the ARDC and DOE Idaho.

### **7.2 Maintenance**

The LTS Pad A lead will complete the following documents to be submitted to the DOE Idaho OU 7-12 project manager for required maintenance activities:

- Maintenance on Pad A will be conducted as identified during the quarterly inspection. A report form will be completed and incorporated into the LTS Program's Pad A file with the results of the maintenance submitted to DOE Idaho and sent to ARDC.
- Any activities pertaining to Pad A will be completed according to a baseline change proposal (BCP) completed by the LTS Pad A lead. The BCP is approved by the LTS program manager and DOE Idaho. The BCP will include technical work scope, a cost estimate, milestones, and a schedule.

### **7.3 Reporting**

The LTS project lead will complete an annual inspection report and send the results to DOE Idaho. The Pad A reports will include the quarterly inspection reports for the year and a summary of the inspection and maintenance activities completed that year, if any. A copy of the annual inspection report for the just-ended fiscal year will be sent to the EPA and DEQ for their files.

## **8. REFERENCES**

DOE-ID, 1994, Record of Decision: Declaration for Pad A at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Administrative Record No. 5632, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; and Idaho Department of Health and Welfare, February 1994.

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## **Appendix A**

### **Operable Unit 7-12 Pad A Inspection of Vegetative Cover, Soil Cover, and Rock Armor Report Form**



## Appendix A

### Operable Unit 7-12 Pad A Inspection of Vegetative Cover, Soil Cover, and Rock Armor Report Form

| Inspection Activity   | Status <sup>a</sup> | Comments, Recommendations,<br>and Location of Concern |
|---|---------------------|---|
| 1. Inspect for non-growth areas (larger than a 10 × 10-ft area).                              |                     |   |
| 2. Inspect for sparse growth areas or areas that have degraded since last year.               |                     |   |
| 3. Inspect for encroachment of weeds or shrubs.   |                     |   |
| 4. Inspect for erosion and/or subsidence areas in excess of 3 in. in depth or 6 in. in width. |                     |   |
| 5. Inspect for signs of ponding or localized subsidence.                                      |                     |   |
| 6. Inspect for any animal intrusion into the soil cover.                                      |                     |   |
| 7. Inspect to verify a minimum of 12 in. of rock armor.                                       |                     |   |
| 8. Inspect for places that need additional rock armor.  |                     |   |
| a. Status: Satisfactory (S); Unsatisfactory (U); or Not Inspected (NI).                       |                     |   |
| <b>Additional Comments:</b>   |                     |   |
|   |                     |   |
|   |                     |   |
| Inspection date:  |                     |   |
| Inspector's name:   |                     |   |
| Inspector's signature:  |                     |   |